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Hardening the Categories - The Problem Of Reliability In Identifying Themes Using Grounded Theory While Investigating What Theories Underpin E-Learning

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HARDENING THE CATEGORIES – THE PROBLEM OF RELIABILITY IN IDENTIFYING THEMES USING GROUNDED THEORY WHILE INVESTIGATING WHAT THEORIES UNDERPIN E-LEARNING.

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HARDENING THE CATEGORIES – THE PROBLEM OF RELIABILITY IN IDENTIFYING THEMES USING GROUNDED THEORY WHILE INVESTIGATING WHAT THEORIES UNDERPIN E-LEARNING.

1. INTRODUCTION – The Context of the Research.

The background research to this paper is focused within the context of a Higher Education Institution in the Republic of Ireland. The question, which drove the main focus of the research as a whole is: - '*How can the Institution improve Staff Development processes to enable staff to develop blended (including online) learning, to enhance Learning and Teaching?* This paper describes a critical element of the main research process.

In seeking to answer the question our individual participation in the research as agents as well as researchers is acknowledged. Clearly there are all kinds of questions of subjectivity, objectivity, distance and professional issues, which we recognise from the outset and it is a theme that we will return to later. The focus is broadly a research-based observation through an activity-based study, and while the conclusions recognize the limitations of general applicability, the work none-the-less makes a contribution to understanding some key issues regarding the reliability in identifying themes using Grounded Theory (GT) while investigating what theories underpin e-learning in the particular environment in which the research was conducted. A similar environment of staff development exists across the Higher Education spectrum and that may encourage further investigations, which could have broader application.

The Institution had invested substantially in technology. Many of our staff colleagues aspire to achieve excellence in their daily contact with students, but to enable them to engage effectively with the latest technology in the delivery of flexible web-based courses required considered reflection of what the processes of continuous improvement of staff might consist.

While there is a great deal known about Staff Development generally, there are significant unknowns when considering what is needed to ensure an enhanced learning and teaching environment in which staff include Information and Communications Technologies (ICTs) as part of their design and delivery of academic programmes. The affordances of the technology are not yet fully understood, in turn limiting how they may best be exploited.

> Learning Technology is a relatively young research area, which is now beginning to emerge as a separate research area. Many described instances of e-learning claim to draw on theoretical positions, such as constructivism, without explaining how they embody the principles and values of that approach (Console, 2003).

Apart from what is claimed theoretically regarding learning and teaching in Higher Education, quite a number of staff, except perhaps those with an Education discipline, or having undertaken such studies as part of their continuing development, seem to have limited knowledge or experience of the pedagogy that underpins a good learning and teaching environment.

The development of effective use of technologies was in line with the aspiration of most educational institutions and the policy makers who fund them. However the achievement of the desired outcomes and their related potential in learning is still a challenge.

> Despite an ambitious programme of investment in ICT resources, infrastructure and teacher training, there is no evidence of change of the radical kind observable in the commercial world. It is almost certainly because the structures, rules of behaviour and the division of labour in schools is so rooted in longstanding traditions and authority structures, that the potential for ICT to have significant impact on learning has not so far been realised. (Somekh, 2001)

There may be wide-ranging reasons as to why this potential has not yet been realised and the background investigation was focused on one aspect of the challenge – that of informing how best to support staff development to make an effective transition to using the technologies.

The Institute made provision for two significant resources, a Learning and Teaching Centre (LTC), staffed mainly by colleagues from an Education discipline, some of whom also had experience of ICTs, and a Learning Technology Team (LTT), composed of staff with both an educational and a technological background.

The discussion of pedagogy and professional development, including the practical skills development necessary to use the technologies, and the new learning undertaken to represent course design using those technologies, seemed to fit within the wider context of a socio-cultural framework, encapsulated by Bruner:

> Although meanings are "in the mind", they have their origins and their significance in the culture in which they are created. It is this cultural situatedness of meanings that assures their negotiability and, ultimately, their communicatability. (Bruner, 1996).

The learning environment has been and continues to undergo change in various ways. There is change to a student-centred learning paradigm, change in technologies available to represent course design, change in the affordances of the technology, in turn affecting change in the social relationships among staff and students. Some research findings in this area of 'Change' as it affects Institutions distinguish between 're-structuring' and 're-culturing' an organisation (Fullan, 1998). The provision of the LTC and the LTT could be seen as a re-structuring change. Their provision brought into the context some related structural and institutional issues that presented some new challenges and tensions. From a management perspective their introduction provided a support for learners across the Institution; however the use of the resources has been left to individual choice. Colleagues, who value their own autonomy greatly, viewed the resource from different perspectives. Some seemed to have welcomed the facilities warmly as an opportunity for personal development, others have regarded them as yet more demand on their jealously guarded personal time and space. A primary emphasis from the LTC and the LTT has been to prioritise, in their course provision,

that the theoretical underpinning necessary for course design, development and delivery is absolutely essential. This support encouraged the development of the research by contributing a necessary element of the 'situatedness' as staff interacted with the support centres during the process of data collection.

In concluding this introduction to the paper setting out the context of the research, the research question helped to focus a number of issues. There were:

- the challenges at the individual staff level related to the use of technology;
- the challenges through changes in pedagogy related to that technology;
- the significant (apparent) paradigm shift in learning and teaching afforded by the technology affecting the new and growing research discipline of e-learning;
- a major disturbance in relation to the previous position of lecturer autonomy, which is related to these first three points;
- structural implications fed by the need for the LTC and LTT to establish new relationships with Faculty and academic management, and with academic staff;
- the expectation of a cultural shift from the previous ways of learning, teaching and knowing

Given the context of the research we concluded that the use of Grounded Theory (GT) would best facilitate the emergent themes arising from the data collected through individual and group interviews held with the staff. The use of GT was regarded as a suitable supportive methodology alongside the tentatively held research model described below. Somekh in arguing a case for suitable methodological choices in research towards the improvement of education states

> For the researcher to have a genuinely open mind implies a grounded theory approach to the collection and analysis of data. (Somekh, 2001)

Acknowledging the subjective tendencies inherent in our involvement in the research and emphasised by the use of GT to interpret the data collected from colleagues, considerable effort was made to counter balance this. This paper discusses the results of the analysis which sought to identify the themes in learning categories arising from independent selection by the researchers using individual and group interview discussions among academic staff which were transcribed in full for the purpose of analysis and selection.

2. THE THEORETICAL FRAMEWORK AND METHODOLOGY

2.1 Models of Teachers' Knowledge.

In selecting some models to focus on, that of Shulman (Shulman, 1987) is emblematic in terms of teachers' knowledge in general. There are of course many other models that could be used. Shulman concentrates on the individual components that make up teachers' knowledge. A different approach is taken by Brown and McIntyre.

> …because of the emphasis of many researchers on exploring teachers' knowledge in terms of its components before they move on to models of integrated knowledge (for example the model of Brown and McIntyre) (Pepin, 1999)

We used Shulman's and Brown and McIntyre's models since we were looking for the individual components that our colleagues raised in connection with their teaching but we were also trying to identify integrated themes among them. To save space the details of the models will not be discussed here except to mention one of Shulman's components, pedagogical content knowledge, in relation to another possible element that may now need to be included in the professional knowledge base of a teacher. Since we have moved significantly into using the affordances that have become available by the introduction of ICTs, pedagogical technological content knowledge came to the fore in the development of the theoretical framework for the research model. This is discussed further below.

2.2 Conclusions from the related Literature.

From a targeted review of the literature a number of conclusions were reached which have a great deal of relevance to both the themes and the methodology for taking forward the research in relation to those themes in the context of this study. Since these themes influenced the methodology and data collection it is convenient to discuss them in four groups.

2.2.1 Learning & Teaching.

2.2.1.i There was a need somehow to try to identify what pedagogies staff were using, since their grounding assumptions about learning and teaching directly determine what they design (Pepin, 1999), (Duffy, 1997).

2.2.1.ii Since there was the likelihood that these pedagogies were implicit in their thinking and possibly not likely to be explicitly expressed we would need to listen very carefully to their thoughts on such issues and to be proactive to include the staff in the process of data collection (Shavelson, 1981).

2.2.1.iii There was a need to capture teachers 'thought in action', through asking staff to reflect on their conceptions of teaching, teaching expertise and experience in the classroom and by encouraging them to remake knowledge 'in the present' they might also develop further meaningful frameworks for personal development. (Featherstone, 1987), (Pepin, 1999).

2.2.1.iv By encouraging reflection on their teaching, teaching expertise and experience in the classroom we might identify individual components of their knowledge of teaching. Where possible these individual components should also be assessed from an integrated perspective and an attempt made to integrate their responses into a 'generalisable' framework (Shulman, 1987), (Brown, 1993).

2.2.1.v Somehow we would need to determine how global access to learning and teaching resources affect existing pedagogy and whether there are any new categories in the knowledge base of teachers (Koehler, 2004), (Mishra, 2004).

2.2.1.vii Reflection on the data gathered might then help to identify what teachers need to know and how they need to represent it to facilitate a student-centred learning environment (Babchuk, 1997).

2.2.2. Change in Technology

Given the assumption that a paradigm shift has occurred related to technology associated with learning and teaching there may be possible unknowns regarding learning theories with the introduction of the affordances of ICTs into the learning environment.

2.2.2.i Using this technology changes the scope and competencies required of academics (Salmon, 2000). We needed therefore to identify the changes in order to answer the research question of how the Institution could improve Staff Development processes to enable staff to develop blended (including online) learning to enhance Learning and Teaching.

2.2.2.ii Clarity needed to be brought to staff learning and training needs to ensure that all academic staff seeking to transition from traditional learning understand the role of the online teacher (Salmon, 2000).

2.2.2.iii Across the range of different options for teaching and learning using these technologies it would be important to distinguish between the opposing trajectories of learning and training. Encouragement of the outward trajectory of learning could be encouraged if new knowledge building communities were established to facilitate staff development. The research should seek to identify how these communities would be formed and facilitated (Wenger, 1998), (Bereiter, 2002).

2.2.2.iv The changes in technology also change the fabric of culturally patterned ways in which we undertake scholarship and work. It would be essential to respond to these changes creatively and in a way that would be supportive of staff (Somekh, 2001).

2.2.2.v Understanding and responding to these changes appropriately would contribute directly to achieving Institutional change (Somekh, 1997).

2.2.3. Institutional Change

2.2.3.i Fundamental technological change would ultimately beget structural change. Therefore supportive policies of staff involvement should be established during the research by encouraging inclusiveness in the process (Massy, 1997).

2.2.3.ii It would also be important to have an inclusive involvement with staff to maximise the possibility that they accept that they can be change agents in the wider process of institutional change (Somekh, 1998).

2.2.3.iii It would be essential to identify how educational, structural and cultural traditions affect staff development approaches (Pepin, 1998).

2.2.3.iv At a systemic level a change of culture that would bring together a radical craft culture and a research culture may be needed to achieve effective education reform (Bereiter, 2002).

2.2.3.v The research should try to understand how best to accomplish primary goals of higher education through a clearer policy for staff development (Black, 2001).

2.2.3.vi A clearer understanding of the Inward and Outward trajectories of learning and training could contribute to a more effective staff development process (Wenger, 1998).

2.2.4. Methodology

A sociocultural theoretical framework seemed to be the most hopeful way to investigate computer supported collaborative learning developments. The policy of inclusiveness of staff would fit this framework. However it was noted that tools associated with such environments could also be used within both the cognitive constructivist and the social constructivist viewpoints. Encouraging new knowledge building communities might need to embrace the cognitive aspects at the same time.

2.2.4.i Asking staff to remake knowledge in the present by encouraging them to talk about teaching would provide a rich and diverse source of data collection from a range of traditions, within the national culture (Barnes, 1989), (Pepin, 1998).

2.2.4.ii Involving academic staff directly in the research process might be a way to 'use the research' to influence change through them as it could encourage them to become change agents (Morine-Dershimer 1990, in (Brown, 1993)).

2.2.4.iii The framework for the research needed to be flexible to encompass the rich diversity that may arise from accessibility and availability of global learning resources, bearing in mind that previous cultural foundations have impinged on earlier models of research into learning and teaching that are now informing new research based on the new paradigm of global resources and affordances for learning and teaching (Pepin, 1999).

2.2.4.iv Ensuring that data was collected from staff in different academic disciplines and in different faculties would provide opportunity for a representation of the external business environment (Pepin, 1997).

2.2.4.v The use of Grounded Theory held out a way to apply principled analytical strategies, which would directly support the tentativeness of the research framework (Babchuk, 1997).

2.2.4.vi Analysis of the data should seek to identify individual components that make up the knowledge teachers bring to any reflective processes of experience in the classroom. However an attempt should be made to retain an emphasis on an integrated interpretation across all the individual components (Shulman, 1987), (Brown, 1993).

2.2.4.vii The triangular model diagram representing the relationships between knowledge, teacher and pupil needed extension to reflect how the knowledge is represented using technology (Mishra, 2002).

These four themes are picked up below since they affected the framework of the research and the methodology.

2.3. Developing a Theoretical Framework for the Research

Given the apparent paradigm shift that has taken place in learning and teaching, based on the affordances of Internet technology the theoretical framework for the research has been held with some tentativeness. Despite the tentativeness the framework also needed to be robust enough to enable the research to progress successfully.

The learning and teaching relationships between Teacher and Pupil and the Knowledge being shared between them have been represented with a triangular framework and this robust model was a starting point to design the framework.

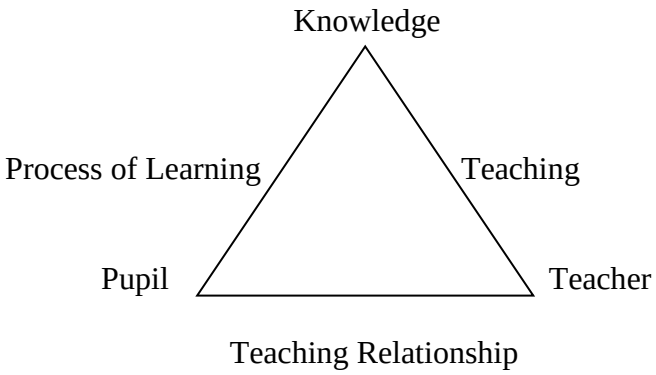


Figure 2.

Recently, attempts have been made to come up with some models for effective integration of technology in the design and delivery process so that learning is enhanced. Technology alone does not lead to change. Rather it is the way in which future teachers use the technology that has the potential to change education. (Carr, 1998).

One such example was a Transactional Model (Mishra, 2002), where Content, Technology, Representation and Pedagogy were identified as four components that needed to be integrated for good online courses.

They used a diagrammatical representation based on a tetrahedron.

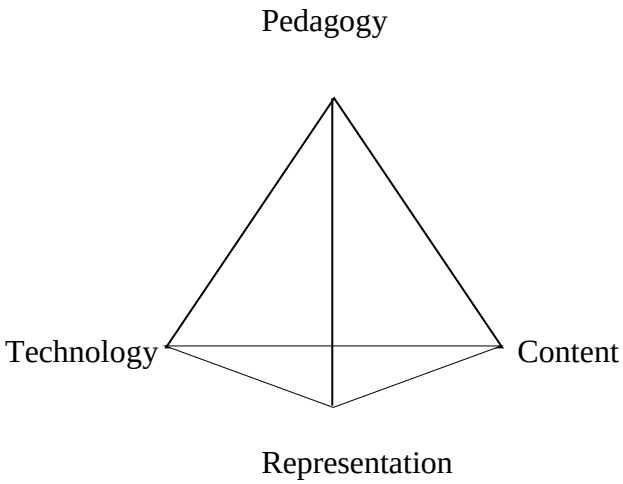


Figure 3.2

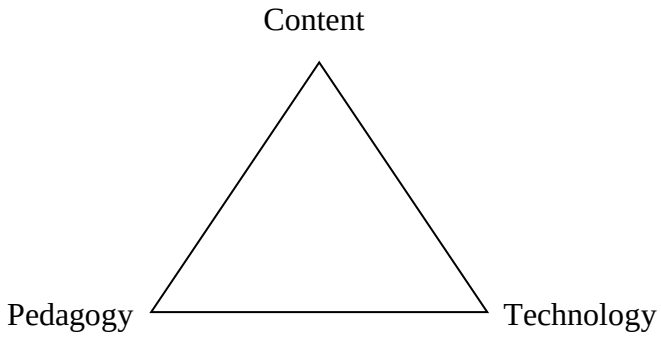
> They claimed that the model formed the basis for how we think about technology in teaching in general and in particular how we think about developing faculty (*staff, in Europe*) to teach online.

They argued that separating these four key issues is an analytic act and one that is extremely difficult, as the four exist in a state of dynamic equilibrium, relating their argument to the philosopher Kuhn on the state of 'essential tension' (Kuhn, 1979) in (Mishra, 2002).

In trying to establish a theoretical framework suitable for the research the corresponding author had realised that there are a range of key components between which there are such interdependent relationships. He too had used a tetrahedral representation. Decisions about any one of the components had implications and consequences for others related to them. However the components he identified were not the same as those identified by Koehler and Mishra with whom he communicated at the time. He argued that the Technology was more accurately described as simply another 'more sophisticated' form of the representation of the course design and content, earlier examples being the blackboard (or slate and chalk!). Moreover he was convinced that the concept of pedagogy was better represented, not as a component, but through the learning theories that related some of the components to each other.

It is interesting to note that Koehler and Mishra have amended their thinking in the published version of the paper (Koehler, 2004) and in an intermediate paper have also identified a possible additional component in the knowledge base for teachers.

By reverting to a triangular model



(Koehler, 2004), (Mishra, 2004)

Figure 3.3

they have included in the definition of technology both the 'commonplace', like chalkboards, and the 'advanced', such as digital computers, thus incorporating into the technology node the concept of representation. They argue that the framework emphasises the connections, interactions, affordances, and constraints between and among the content, pedagogy and technology

> that is we make an argument similar to that of Shulman (1986) who argued that knowing a content domain, and general purpose pedagogical techniques was not sufficient – arguing instead for a form of context-specific and highly integrated way of knowing that he labelled "pedagogical content knowledge" (Mishra, 2004).

They develop the argument that by the addition of technology into a model of teaching requires knowledge about technology, ..

> but also knowledge of the complex interplay of Content (C), Pedagogy (P), and Technology (T). Thus we extend Shulman's argument beyond a sensitivity to pedagogical content knowledge (C-P), but also content-technology knowledge (C-T), pedagogical-technology knowledge (P-T), and even pedagogical-technological-content knowledge (C-P-T) (Keating, 2001) in (Mishra, 2004).

We do not fully understand the argument but decided it would be useful to be alert to the possibility that an additional component might need to be added to Shulman's original model and to pro-actively seek to determine if this was so within the broader framework for the research. Perhaps the possibility arose from the intersections of the components as represented by the triangular model,

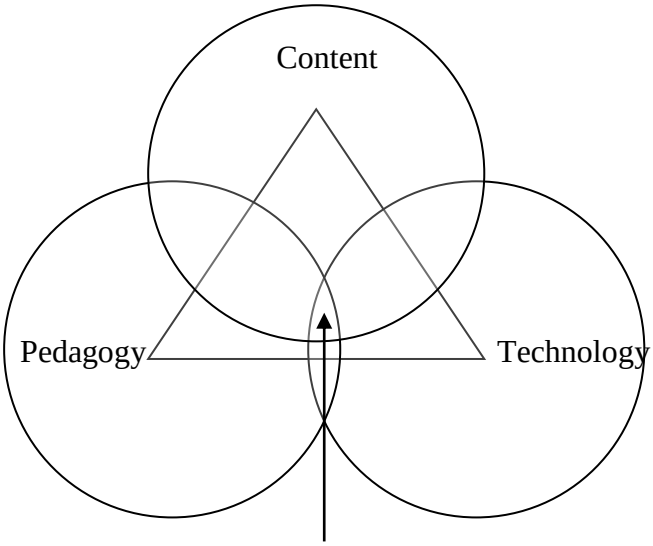


Figure 3.4

but the corresponding author was content that the tentatively held framework described below could facilitate the investigation.

Since he wanted to have a robust framework that would facilitate the research as it developed he had drafted a number of tetrahedral models with various key concepts allocated to the nodes. Trying to fit these tetrahedra together so that the same concept represented by a node was located at the same physical point produced quite an elaborate 'bee-hive like structure'. It certainly gave a visual picture of the complexity of the various and integrated relationships, but it was too complex to use as a working framework. In the end he identified one particular tetrahedron to bring focus to the research with four key components as shown below.

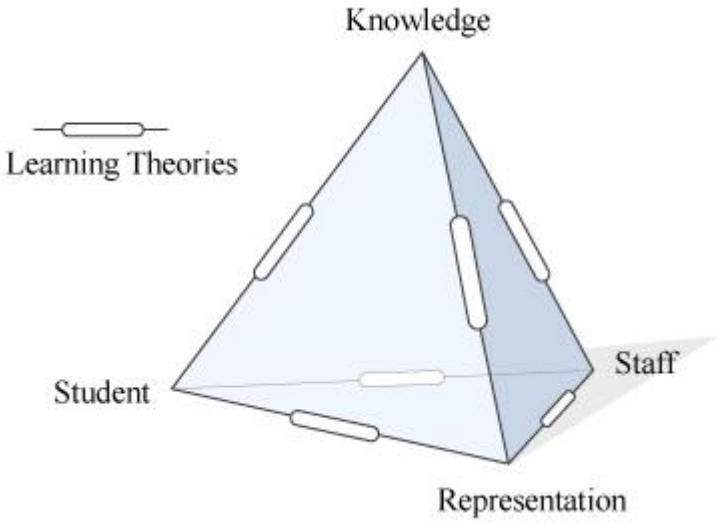


Figure 3.5

Under Knowledge is included the Curriculum, the Syllabus, the components of the teacher's knowledge and such matters that would be included in the broad body of knowledge, associated with an academic discipline as suggested in Shulman's model. The representation was intended to include how the body of knowledge would be communicated between staff and student, allowing both to be learners, using whatever 'technology' was deemed effective, and including the affordances of ICTs.

The theoretical framework is designed to facilitate consideration of both staff and student sides of the tetrahedron as the research progresses but the first phase is to give focus to the staff side. Further investigations, noting the relationships between staff and student, could follow up the perceived learning by the student and in particular look for any correlation between student learning and the proposed improvements in support for personal development to enable staff in the Institution to use ICTs effectively.

It is important to include in the framework some acknowledgment of the learning environment. This would include the broader business environment since both staff and students would be influenced by and learn through their involvement with the workplace. So

as a framework for the research the following figure is offered as a diagrammatic representation, where the circular boundary represents the learning environment: -

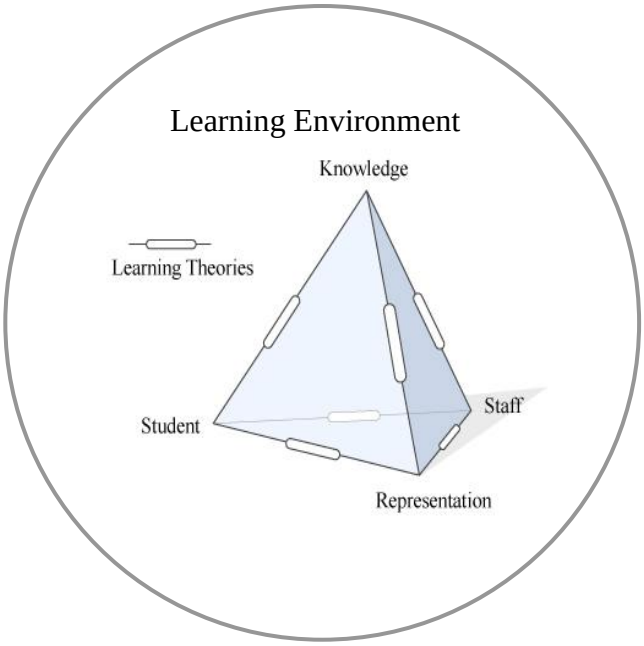


Figure 3.6

The intention is to investigate what is happening between the components as represented by the nodes of the tetrahedron regarding learning and teaching theories as represented by the edges of the tetrahedron, concentrating in this initial stage on the staff related aspects only. It was considered essential to have a better understanding of these relationships and theories in order to provide an informed answer to the question of how best to support personal development to enable staff within the Institution to use ICTs in a way that will enhance teaching and learning.

As described in the methodology below, towards the end of the interview process staff were asked to comment on this framework. Using the diagram in Appendix A in an associated handout they were also asked to engage with a simplified version of the 'toolkit' (Console, 2004) offered as a model to encourage staff develop pedagogically driven approaches to learning design.

2.4. The Methodology

The targeted literature review contributed to the sharpening of the research question and to the theoretical framework for the research. It also suggested criteria to be used in the methods to capture the data and how the choice of Grounded Theory (GT) as a principled analytical strategy for analysis of that data might provide the flexibility we were keen to preserve and maintain as the research developed.

One possible way to build theories that might underpin the relationships between Staff, the Knowledge they are building, and how they apply that knowledge to the design, development and Representation of learning material, including the use of ICTs would be to test pre-existing hypothesis that came from somewhere, suggested by someone.

An alternative approach, which underlies the theoretical basis for GT is to use data, suitably collected to provide richness and diversity, in such a way that it stimulates and shapes the inductive processes of the researcher. The guidelines to use in this latter approach have been outlined extensively in the literature on GT covering a wide range of problem areas. A particularly informative paper is the winning Graduate Student Research Paper from the 1996 Midwest Research-To-Practice Conference in Adult, Continuing and Community Education (Babchuk, 1997) in which he draws on an exhaustive review of the relevant literature, coupled with hands-on experience with this method. Without taking sides he presents the key issues that distinguish the different understanding of GT that arose between Glaser and Strauss in the years following their joint introduction of the methodology (Glaser, 1967). GT is a qualitative methodology deriving its name from the practice of generating theory from research which is "grounded" in data, although more accurately, noting the distinction between observed data and the phenomena that any theories constructed from the data seek to explain and predict, it is agreed that the general goal of grounded theory is to construct theories in order to understand phenomena.

At the heart of GT analysis is the coding process, which consists of three types: open, axial, and selective. The coding system adopted to facilitate identity and easy access back to the original transcripts for further reflection in context is explained below.

To complete this section an explanation is given of the rationale behind the range and number of informants chosen to contribute to the data collection and how they were selected, with some introduction of the plan and tools used for the data collection.

2.4.1 The range and selection of informants

To contribute to a rich and diverse source of data that would be required the range of informants encompassed five undergraduate degree programmes from three schools across two Faculties of the Institution.

Further diversity was deliberately encouraged by identifying degrees that were delivered to students who were in full-time and in part-time mode of study. Within those degrees there was further diversity among the academic staff because some were full-time employees of the Institution and others were part-time pro-rata contracted staff. Within each programme the awareness by the academic staff of the affordances of ICTs ranged from very little awareness to considerable confidence in exploiting the affordances of the technology. However even if the academic staff member had confidence to seek to exploit the affordances that did not necessarily mean that he/she had a corresponding confident understanding of the theoretical underpinning of the learning theories that could guide an appropriate use of that technology. Although it was not intended to use the male / female aspect of the range there were both genders represented on each of the five degree groups of staff.

2.4.2 The Data Collection Plan

In order to provide a rich and diverse source for data collection the staff were invited to remake knowledge in the present by encouraging them to talk about teaching. That was intended to involve the staff directly in the research process and provide access to what they

were thinking about learning and teaching both theoretically and practically. Secondly, in order to capture this remake of knowledge at both an individual and group level the decision was made to interview each individual on each degree group using the series of question in Appendix A to guide the interviews. The intention behind the use of these questions was to set the interviewee at ease by asking them to share positive experiences of their own teaching experience and then to elaborate on this depending on their introductory responses. However the pre-conceived questions were intended to maintain some order on the discussions and to try to ensure that a similar range of content was covered as far reasonably possible, but without overly controlling the interview. These individual interviews were followed up by a group discussion a few weeks after the completion of the individual interviews for each group, covering similar content, but long enough after the individual interviews to hope that the informants would not be overly influenced by memory of what they had shared at the individual times.

All these interviews were digitally recorded for later transcription and an example of the layout of the transcribed documents is shown in Appendix B.

2.4.3 The Data Analysis Process

The three authors of the paper used identical copies of the transcribed documents to carry out 'blind' analysis. They underlined on the right hand column of their copy of the transcription text what they considered to be the learning categories on each transcript and inserted in the left hand column their description of the category. An example of their work is available in Appendix C. To enable quick accurate access to these original records each instance of an identified category a simple (Open) coding system was adopted to identify each category using the Degree, the Staff, the Page, and the Line Number on the page. Each author, or Rater was given a Code, A1, A2, or A3. Using this coding system an Excel Spreadsheet was created recording these elements of the code, plus the Interview Question Number and a brief

alphabetic description of the category identified. Where a Rater identified a Category this was recorded as 1, and a total T, for that category for A1 + A2 + A3 was calculated. See the example in Appendix D and compare the transferred lines with Appendix C. Some careful reflection on the alphabetic descriptions suggested by the Raters was eventually required, for example, in describing 'Group/Individual Issues' related to Interactive learning in groups this might also have been coded as 'Individual/Group Issues'. These were not adjusted to reflect the same category initially but later taking an Axial Coding approach they were grouped as they obviously meant the same category. Initially the data was sorted alphabetically by Category and also by descending Occurrence (T, the total of A1 + A2 + A3) of each category. This enabled the identity of categories where all three Raters agreed, where 2 out of three Raters agreed and where only one Rater identified a category. Inter Rater Reliability tests were carried out and these are available below together with the results of various reflections carried out on the individual analysis by the Raters. The analysis of the transcripts was used to focus the further selection of categories using GT in order to inform later focus group interviews of the broader research that contributed to the identity of the learning phenomena arising from the data. The remainder of the paper sets out the results of the analysis to identify the categories.

2.5 RESULTS OF THE IDENTITY OF CATEGORIES.

2.5.1 Inter Rater Reliability

The following is an example of the Reliability tests performed on the data using the Binomial Test. Only Degree 5 and All Degrees are shown to save space but the details will be available at presentation of the paper.

Total Sample

Binomial Test

		Category	N	Observed Prop.	Test Prop.	Asymp. Sig. (2-tailed)	
Rater 1 with Rater 2	Group 1	Agree	345	0.568	0.500	0.001	P<0.001
	Group 2	Disagree	262	0.432			
	Total		607	1.000			
Rater 1 with Rater 3	Group 1	Disagree	255	0.420	0.500	0.000	P<0.001
	Group 2	Agree	352	0.580			
	Total		607	1.000			
Rater 2 with Rater 3	Group 1	Disagree	259	0.427	0.500	0.000	P<0.001
	Group 2	Agree	348	0.573			
	Total		607	1.000			
A	Based on Z Approximation.						

Degree 5

Binomial Test

		Category	N	Observed Prop.	Test Prop.	Asymp. Sig. (2-tailed)	
Rater 1 with Rater 2	Group 1	Agree	55	0.324	0.500	0.000	P<0.001
	Group 2	Disagree	115	0.676			
	Total		170	1.000			
Rater 1 with Rater 3	Group 1	Disagree	61	0.359	0.500	0.000	P<0.001
	Group 2	Agree	109	0.641			
	Total		170	1.000			
Rater 2 with Rater 3	Group 1	Disagree	104	0.612	0.500	0.004	P<0.01
	Group 2	Agree	66	0.388			
	Total		170	1.000			
A	Based on Z Approximation.						

2.5.2 Percentage Agreement of Occurrence of Categories identified by Raters

The following table shows the percentages where Raters identified categories independently on the identical transcripted interview layouts, specifically where all agreed, where two out of three agreed, and which two; and where only one selected specific text and which one:

Degree	**All agree**	**2/3 agree**	A1 and A2	A1 and A3	A2 and A3	**1 only**	A1	A2	A3	No. Cat.s
1	**32**	**28**	34	54	12	**40**	61	10	29	146
2	**34**	**35**	42	42	19	**30**	42	36	21	136
3	**37**	**31**	39	35	26	**31**	50	32	18	71
4	**27**	**48**	25	55	18	**24**	52	10	38	83
5	**44**	**36**	49	37	14	**18**	57	25	18	170
All Degrees	**36**	**35**	38	44	17	**28**	53	22	25	606

2.5.3 After Selective Coding - Highest Occurrences of Categories

All lines of each transcript were given a unique Open Code of Degree, Staff, Page, Line, Question. Where categories were selected by Raters these were transferred to an Excel spreadsheet including the Raters identity A1,A2 and A3. Using Axial Coding all duplicate categories were grouped. This process of grouping was repeated for perceived duplicates e.g. Group/Individual Issues and Individual Issues were regarded as describing the same category. Finally using Selective Coding further Perceived duplicates were grouped, e.g. Benefits of Technology and Perceived Benefits of Technology. The following results were obtained:-

Degree 1

Categories after Selective Coding	No.
Group Interactive learning	15
Group/Individual Issues	10
Perceived Potential of technology	8
Feedback to students	8
Collaboration benefits	7
Reflection	7
Theory and practice	7
Prior learning	6
Time	6

Degree 2

Categories after Selective Coding	No.
Group Interactive learning	17
Perceived Potential of technology	15
Theory to practice	11
Time	9
Group/Individual Issues	7
Learning Styles	7
Prior learning	7
Collaboration benefits	6

Degree 3

Categories after Selective Coding	No.
Group Interactive Learning	12
Perceived potential of technology	6
Feedback to Students	4
eModerating	4
Relevant to Students	4
Collaboration benefits	3
Group/Individual issues	3
Learning Theories	3
Prior Learning	3
Time	3

Degree 4

Categories after Selective Coding	No.
Collaboration benefits	10
Perceived Potential of technology	8
Group Interactive Learning	8
eModerating	7
Theory to practice	6
Group/Individual issues	5
Learning Styles	5
Reflection	5
Prior Learning	4

Degree 5

Categories after Selective Coding	No.
Perceived potential of technology	22
Group Interactive Learning	16
Theory to practice	13
Learning Styles	12
Group/Individual issues	11
Collaboration benefits	8
Prior knowledge	8
Time	8
Feedback to Students	6

All Degrees

Categories after Selective Coding	No.
Group Interactive Learning	69
Perceived potential of technology	59
Theory to practice	37
Group/Individual issues	36
Collaboration benefits	35
Time	29
Learning Styles	29
Prior knowledge	28
Feedback to Students	22
Reflection	20
eModerating	19

2.4 CONCLUSIONS

There was a consistently high percentage of agreement between 2 or more of the Raters (Min 60% to Max 80%) in identifying the same words or lines of transcript across each degree. Given the reliability tests on the data, this suggested that the categories identified to further inform the more detailed subsequent Focus Group part of the main research could be regarded as reliable as the issues most prominent in the minds of the staff interviewed.

There was a similar consistency in the use of alphabetic descriptors for the categories used by the Raters. This facilitated the data reduction process using Axial and Selective Coding, requiring relatively minor 'corrections' to maintain a common base for analysis.

If the Group Interactive Learning issues are linked with the issues related to Group and Individual Learning in such groups this 'joint category' has by far the highest occurrence across all degrees. That therefore became the centre issue for further discussion at the Focus Groups, although some of the other high occurrence categories were also discussed.

There was an interesting comparison, across the degrees, where 2 out of three Raters agreed, regarding the agreement between Raters A1 and A2, (Min 25%, Max 49%, 38% all degrees) and A1 and A3 (Min 35%, Max 55%, 44% all degrees) compared to that between A2 and A3 (Min 12%, Max 26%, 17% all degrees). This merits further investigation.

2.6 FURTHER STUDY

Obviously this paper only reflects one analytical aspect of the broader research. It would however be interesting to use an Activity Theory approach to the same question for comparison of the results. The authors intend to progress this aspect further as it is important to ensure that the key objective of informing policy on staff development is solidly informed by research.

APPENDIX A - Interview Questions and Diagrams

Structure of Interviews for Data Collection.

Individual Interviews

(First Interview)

(Welcome and to confirm the person on tape)
***First Name,* Thank you for your time for this interview.**
How long have you been teaching on the *B.Sc*……../ *B.BS* …….

(Broad introductory question to settle them and give confidence)
Can you recall a teaching experience that you feel very positive about?

What do you think made it a positive experience?

Do you see any opportunities and possibilities to develop that sense of positive experience in your delivery of learning to the students on the B.Sc……../B.BS……?

Could you extend that and talk to me about using new technologies? What would you say about where they can take you in terms of the potential and what we have been talking about?

Now, - just one further extension of your thinking. – Talk to me about 'Good Teaching', or 'Enjoyable Teaching', and the issue of collaborating with colleagues in working together.

That has been very helpful. Can I have you comments on one more topic? You've talked about what you enjoy about teaching (*and some of the things you don't enjoy*). Here's a diagram that I have found useful in helping me to think about what we do. Have a look at the diagram and see if there is anything that you feel makes a connection between what you have been saying (*or some things you have not yet said*) and some of the issues that we have been discussing.

Show the tetrahedron[1], and possibly have the axis of learning[2] of individual/social, reflection/non-reflection, and cognitive/experience.

Thank you, *First Name*. I really appreciate your time. You know I will be interviewing some other colleagues. Can I ask you not to discuss the interview with any of them until we meet together as a Group. Many thanks.

[1] The diagram is described in the Theoretical Framework in section

[2] The second diagram is shown below after the Group Interview questions

Group Interviews

(First Interview, to be held after the completion of the first individual interviews)

**Welcome to this group discussion regarding the B.Sc……. / B.BS…….
During our individual discussions we talked about 'good teaching' and 'enjoyable teaching'. I also asked you to try to relate some of your thinking to the diagrams I am working with.**

I would now like to listen to your group discussion as you talk together about developing the course for a blend of learning that will include online delivery.

Here is the same diagram[3] just to have it in front of you for reference.

How do you as a group want to develop the B.Sc……./B.BS…… to have a blend of learning that improves student learning?

Depending on the responses facilitate the discussion to cover…

What have you specified as the (broad) **aims of the course?**

Could you be more specific about the Learning Outcomes? (Knowledge, Know-How & Skill, Competence)

How does your delivery seek to achieve these Learning Outcomes?

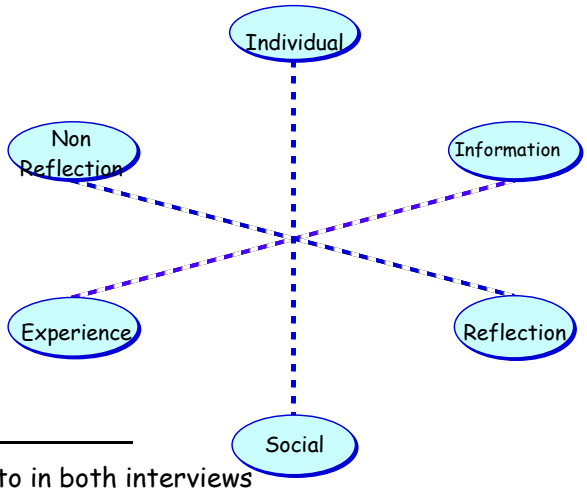
Talk to me about the Constructive Alignment between your Learning Outcomes and your Assessment.

What has influenced your thinking about course delivery?

How do you think the course will be improved?

What do you need / have you had to learn so that you can deliver the new approach?

What are your expectations as you work together?



[3] Diagram referred to in both interviews

APPENDIX B - Transcript used by each Rater for 'Blind' identity of Categories

Q1.	Well Staff I, thanks for your time for the interview. How long have you been teaching on the XXXX courses?
	Over the last 11 years.
Q2.	11 years ok. Well during that period (00.15) maybe that's taking you too far back, but you must have had an experience where you would come out and say that was positive, I really enjoyed that. Can you recall a teaching experience that made you feel very positive? (00.30)
	I can the classes were small enough to participate fully and I got a good, I got good feedback from the class and we were able to discuss the issue and we had time to discuss the issue. (00.45)
Q3.	You've actually begun to unpack it a bit you know, it was a small enough group and you had time, I was going to ask you as a follow up to the question, what do you think made it a positive experience?
	Yeah, what made it a positive experience (01.00) I think were two things. It wasn't a classroom, it was a small group and they were comfortable with one another. They had know each other for a short, a reasonable while so I was comfortable with the topic and (00.15) that we had the time and that was what it was about, that we had the time to discuss something and that the exercise they were carrying out was also enjoyable. So it was a positive experience. (01.30) There was an element of a test about it and they enjoyed that and ah so that's really, and they were also comfortable about the eh content they were learning because I had warned them (01.45) in advance and I had asked them to do a pre-course questionnaire and eh so nobody was surprised by the information so it was sort of a non-threatening environment.
Q5.	Good. So you've mentioned (02.00) time, numbers, non-threatening, prepared in advance, lots of things there. Could you extend that and talk to me about using new technologies? What would you say about where they can take you in terms (02.15) of the potential and what you've talked about?
	Well I think that new technology and having access to PCs allows people to participate (02.30) from their homes and from from distances and it's not that intrusive to e-mail somebody or use a chat room to discuss something with a teacher if you're given the right time. And em so it (02.45) means that em I think you can interact more with the teacher possibly and the class members themselves by sending little e-mails during the week whereas they mightn't see one another, they'd only see one another maybe twice a week. (03.00) If there was new technology there, they might well communicate with each other a bit

APPENDIX C - Open Coded Transcript showing three Raters identified Categories

1				have you got, what knowledge do you have already and to
2				use that more. Em you find out by talking to them (09.45)
A1			1/3	but again participation and talking to them takes time, so
4 Time				time constraints are there and cost factors because you
5				need more classes. Em, and then there's the reflection and
6				non-reflection (10.00) em just to get reflecting on
7				something and then just learning it and doing it, I haven't a
8				comment on that at the moment. The individual and the
9				social is an interesting one because I see people who are
A1		A3	2/3	(10.15) interested in joining groups and others who work
11 Group Individual issues				better on their own. And some people come up to me and
12				ask questions, other people just go away and learn it. Em so
13				somehow we have to (10.30) learn from them so just in
14				terms of the course, the curriculum, and the syllabi, I'm a
15				bit stuck on this one. I have the knowledge, the courses,
16				the curriculum, the syllabi, (10.45) the knowledge hopefully
17				would increase everyday with my own experience in the
18				outside workplace as well so that I can bring it into them.
19				And if I have issues during the day from work, to get them
20				involved, particularly with (11.00) grievance and disciplinary
21				(11.00) and they often open up then get them to use the
22				flip chart or conflict handling, get them to talk about an
A1	A2	A3	3/3	issue at work, get them to compare. So I think size of the
24 Class size				class is a huge factor (11.15) in getting people to learn
25				either as a group. When you're in a very large group more
26				than 15 or 20, people are broken down into little sub-
27				groups, individuals (11.30) so there's less of a chance of
28				learning from one another, it's too big a group. So em what
29				else?
30				You mentioned getting to know students (11.45) and em
31				presenting real life work situations here so are you taking
32				the knowledge you have and trying to, how are you using
33				this representation, teaching and learning (12.00)
34				resources, you're using groups, you're using examples of
35				real work.
A1	A2	A3	3/3	Yeah, examples of real work because they're adults and
37 Real Life scenarios				they're in the workplace. I'm very conscious of that (12.15)
38				and I want to talk to people who have the same
39				experiences. That's my personnel background that would
40				allow me to do that. That's how we operate em and compare
41				it with them and talk to them about their experiences and
42				make them more aware of the (12.30) existence of
43				personnel in the background, in the company even though
44				they're not in personnel departments. So getting to know
45				where they're at, it's difficult sometimes when you have 36
46				in the class. It's getting to know where they're at and
47				that's one way of learning certainly (12.45) and we develop
A1	A2	A3	3/3	then because I learn from them certainly and hear about

APPENDIX D - Example of Open Coding from Transcript on a Spreadsheet

	A	B	C	D	E	F	G	H	I	J
1	Degree	Staff	Page	Line	A1	A2	A3	T	Q	Category
2	2	I	1	9	1		1	2	2	Enabled interaction
3	2	I	1	19	1		1	2	3	Good relationships
4	2	I	1	24	1		1	2	4	Fun
5	2	I	1	29	1			1	4	Advance Preparation
6	2	I	1	44	1	1	1	3	5	Affordances of ICT
7	2	I	2	5	1	1	1	3	5	(In)Equality of access
8	2	I	2	19	1	1		2	5	Technology Potential
9	2	I	2	37		1	1	2	6	Collaborating with technology
10	2	I	2	43	1	1	1	3	6	Locus of Power
11	2	I	3	12		1	1	2	6	Confusion by collaborating
12	2	I	3	46			1	1	7	Prior learning
13	2	I	4	3	1			1	7	Time
14	2	I	4	10	1		1	2	7	Group/Individual issues
15	2	I	4	23	1	1	1	3	7	Class size
16	2	I	4	36	1	1	1	3	7	Real Life scenarios
17	2	I	4	48	1	1	1	3	7	Real Life scenarios
18	2	I	5	13			1	1	7	Group/Individual issues
19	2	I	5	24	1		1	2	7	Group/Individual issues
20	2	I	5	48		1	1	2	7	Application
21	2	I	6	15	1		1	2	7	Relevant
22	2	I	6	19	1		1	2	7	Staff Student learning together
23	2	I	6	29	1		1	2	7	Locus of Power

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